

## REMARKS

The Office Action dated January 26, 2006, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto.

By this amendment, claims 2-5 have been amended and new claims 11-13 have been added. No new matter is presented. Claims 7-10 are allowed. Accordingly, claims 1-6 and 11-13 are respectfully submitted for consideration.

### Allowable Subject Matter

The Applicants wish to thank the Examiner for allowing claims 7-10 and indicating allowable subject matter in claims 2 and 3/2, 4/2 and 5/2. Claim 2 was rewritten in independent form and is therefore now allowable. Claims 3/2, 4/2 and 5/2, have been rewritten as claims 11, 12 and 13, respectively. As claims 11-13 depend from claim 2, these claims are also allowable.

### Rejection Under 35 U.S.C. § 102

Claims 1, 3/1, 5/1 and 6 were rejected under 35 U.S.C. § 102(b) as being anticipated by the article Beam Optics Study of the Gantry Beam Delivery System for Light-Ion Cancer Therapy by M. Pavlovic (hereinafter, "Pavlovic"). Claims 3 and 5 depend from claim 1. The Applicants traverse the rejection and respectfully submit that claims 1, 3/1, 5/1 and 6 recite subject matter that is neither disclosed nor suggested by Pavlovic.

Pavlovic discloses two scanners for the bending plane in a gantry. When a scanner is placed anywhere in the region which is reserved for scanners, the bending magnet tries to focus the beam back. It can be shown that conditions for nearly point-

to-point imaging are satisfied (see Figure 6, scanner 2m in front of the bending magnet). Two scanners for the bending plane must be used in order to overcome this problem. The first scanner deflects the beam away from the optical axis, the second one brings it back. If the focal point of the bending magnet is hit, even parallel scanning occurs. See page 15 and Figures 6 and 7 on page 16 of Pavlovic.

With respect to claims 1 and 6, the Applicants respectfully submit that Pavlovic fails to disclose or suggest the claimed features of the invention. Claims 1 and 6 recite a controller controlling the plurality of scan electromagnets so that kicks provided by the plurality of scan electromagnets are combined in the one direction to form a collimated irradiation field at an exit of the final deflection electromagnet.

The Office Action took the position that Pavlovic discloses a controller. The Office Action stated that "the scanners are controlled to deflect the beam such that the focal point of the bending magnet (the final deflection electromagnet) is hit, so even parallel scanning occurs." However, there is no disclosure or suggestion on page 15 of Pavlovic that the first scanner or second scanner is controlled by a controller in the manner suggested by the Office Action. Therefore, Pavlovic does not disclose or suggest at least the feature of a controller controlling the plurality of scan electromagnets, as recited in claims 1 and 6.

With respect to claim 5, the Applicants further submit that Pavlovic fails to disclose or suggest the claimed features of the invention. Claim 5 recites a plurality of scan electromagnets are disposed independent of each other in X and Y directions. In contrast, Pavlovic does not disclose the arrangement of the scanning magnets X1 and X2.

According to U.S. patent practice, a reference must teach every element of a claim in order to properly anticipate the claim under 35 U.S.C. §102. In addition, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “Every element of the claimed invention must be arranged as in the claim. . . . [t]he identical invention must be shown in as complete detail as is contained in the patent claim.” Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989) (emphasis added). The Applicants respectfully submit that Pavlovic does not disclose or suggest the features of the invention as recited in claims 1 and 6. Accordingly, Pavlovic does not anticipate claims 1 and 6, nor are claims 1 and 6, obvious in view of Pavlovic. As such, the Applicants submit that claims 1 and 6 are allowable over the cited art.

### **Rejection Under 35 U.S.C. § 103**

Claims 1, 3/1, 4/1, 5/1 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Akiyama et al. (U.S. Patent No. 6,218,675 B1, “Akiyama”) in view of Pavlovic. Claims 3-5 depend from claim 1. Akiyama was cited for disclosing many of the claimed elements of the invention with the exception of the plurality of scan electromagnets for one direction. Pavlovic was cited for curing this deficiency. The Applicants traverse the rejection and respectfully submit that claims 1, 3/1, 4/1, 5/1 and 6 recite subject matter that is neither disclosed nor suggested by the cited references.

Claims 1 and 6 recite a charged-particle beam irradiator comprising a plurality of scan electromagnets to scan a charged-particle beam to expand an irradiation field and

that kicks provided by the plurality of said scan electromagnets are combined in said one direction to form a collimated irradiation field at an exit of said final deflection electromagnet. In contrast, Pavlovic discloses that the X1 and X2 scanners are combined to hit a focal point, “[t]he first scanner deflects the beam away from the optical axis, the second one brings it back. If the focal point of the bending magnet is hit, even parallel scanning occurs.” See page 15, paragraph 3 of Pavlovic. However, there is no disclosure or suggestion in Pavlovic a charged-particle beam irradiator comprising a plurality of scan electromagnets to scan a charged-particle beam to expand an irradiation field or that kicks provided by the plurality of said scan electromagnets are combined in said one direction to form a collimated irradiation field at an exit of said final deflection electromagnet, as recited in claims 1 and 6.

Under U.S. patent practice, the PTO has the burden under §103 to establish a *prima facie* case of obviousness. In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Both the case law of the Federal Circuit and the PTO itself have made clear that where a modification must be made to the prior art to reject or invalidate a claim under §103, there must be a showing of proper motivation to do so. The mere fact that a prior art reference could arguably be modified to meet the claim is insufficient to establish obviousness. The PTO can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. Id. In order to establish obviousness, there must be a suggestion or motivation in the reference to do so. See also In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (prior art could not be turned upside down without motivation to do so); In re Rouffet,

149 F.3d 1350 (Fed. Cir. 1998); In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Lee, 277 F.3d 1338 (Fed. Cir. 2002). The Office Action restates the advantages of the present invention to justify the combination of references. There is, however, nothing in the applied references to evidence the desirability of these advantages in the disclosed structure.

In view of the above, the Applicants respectfully submit that the Office Action has failed to make a *prima facie* case of obviousness for purposes of a rejection of claims 1 and 6 under 35 U.S.C. § 103. The Applicants also submit that the combination of Akiyama and Pavlovic fail to disclose or suggest the present invention as claimed in dependent claims 3/1, 4/1, 5/1.

### Conclusion

As noted above, claim 2, which was indicated as containing allowable subject matter, has been rewritten in independent form. Claims 11-13 depend from claim 2 and are also allowable.

Claims 3-5 depend from claim 1. The Applicants respectfully submit that each of these claims incorporate the patentable aspects thereof, and are therefore allowable for at least the same reasons as discussed above. Accordingly, the Applicants respectfully request withdrawal of the above-noted rejections, allowance of claims 1-6 and 11-13 and the prompt issuance of a Notice of Allowability.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Docket. No. 107292-00023.**

Respectfully submitted,



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Enclosures: Extra Claims Fee Transmittal  
Petition for Extension of Time (one month)